U.S. Department of Transportation
Federal Highway Administration

Priority, Market-Ready Technologies and Innovations

Roundabouts

Problem: Intersection crashes account for more than 40 percent of all crashes

Intersection safety is a serious problem in the United States, and addressing this problem is one of the Federal Highway Administration's (FHWA) top priorities.

In 2001, there were nearly 3 million intersection-related crashes, accounting for more than 40 percent of all crashes in the United States. This same year, intersection fatalities rose to 8,876, or 21 percent of all traffic fatalities. In addition, approximately 50 percent, or 1.5 million, of all injury crashes occurred at intersections. Each year, side-impact crashes cause more than one-third of all vehicle occupant deaths. This type of collision occurs most frequently at intersections.

Why are there so many intersection crashes?
An intersection is, at its core, a planned point of conflict in the roadway system. With different crossing and entering movements by both drivers and pedestrians, an intersection is one of the most complex traffic situations that motorists encounter. Add the element of speeding motorists who disregard traffic controls, and the dangers are compounded.

Who is most likely to be affected?
Senior drivers and pedestrians are particularly vulnerable at intersections. Senior drivers (ages 65 years and older) are more likely than younger drivers to cause a fatal crash at an intersection. These drivers also are more likely to receive traffic citations for failing to yield, turning improperly, and running stop signs and red lights.

Putting It in Perspective

In 2001:

- One intersection-related fatality every hour.
- One intersection-related injury crash every 30 seconds.
- Financial loss of $90 billion from intersection crashes.

Solution: Roundabouts are a proven, international safety solution that prevent and reduce the severity of intersection crashes

Over the past 25 years, U.S. intersection designs and traffic engineering measures have improved, but the annual number of intersection fatalities has not changed significantly. To reduce crashes and improve intersection safety, FHWA recommends the use of roundabouts, where appropriate. Roundabouts must be designed to meet the needs of all road users—drivers, pedestrians, pedestrians with disabilities, and bicyclists. When designing roundabouts, special considerations must be given to the needs of pedestrians with visual disabilities who are unable to judge adequate gaps in traffic at roundabouts. Proper site selection and pedestrian channelization are essential to making roundabouts accessible to all users.

What is a roundabout and how does its design improve intersection safety?
A roundabout is a circular intersection that is designed to meet the needs of all road users—drivers, pedestrians, pedestrians with disabilities, and bicyclists.

A roundabout eliminates some of the conflict traffic, such as left turns, that cause crashes at traditional intersections. Because roundabout traffic enters or exits only through right turns, collisions that do occur typically are less severe than those at conventional intersections. A roundabout also is safer than a traffic circle or a rotary, both of which are larger and operate under different traffic rules.

The three safety design features of a roundabout are yield control of entering traffic; channelized approaches; and geometric entry curvature. These three features are key to the success of a roundabout, because they effectively decrease driving speed (typically to 48 kilometers per hour (30 miles per hour) or less). Unlike a traffic circle or a rotary, a roundabout's incoming traffic yields to the circulating traffic. This creates a safer driving environment than that of traditional intersections.

Successful Applications: Roundabouts demonstrate success in reducing crashes

Research indicates that well-designed roundabouts can be safer and more efficient than conventional intersections. A December 2002 report by the Maryland Highway Administration indicates that 15 single-lane roundabouts have greatly improved intersection safety in that State. The analysis shows a 100 percent decrease in the fatal crash rate; a 60 percent decrease in the total crash rate; an 82 percent reduction in the injury crash rate; and a 27 percent reduction in the property damage-only accident rate. This report is available for download at **http://safety.fhwa.dot.gov**.

Benefits

- Crashes are less severe than other intersection crashes.
- Safer than traditional intersections.
- Cost-effective way to improve intersection safety.

Additional Resources

FHWA has published a comprehensive guide called *Roundabouts: An Informational Guide*. The information supplied in this document is based on established international and U.S. practices and is supplemented by recent research. Call 202–366–5915 to order Publication No. FHWA-RD-00-067, or download this guide from the Web at **www.tfhrc.gov/safety/00068.htm**.

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